PATHWAYS TO COLLEGE & CAREER READINESS

Career Clusters®

ADVANCE CTE

State Leaders Connecting Learning to Work

Advancing the National Career Clusters Framework

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Purpose Statement:

The National Career Clusters Framework provides structural alignment and a common language to bridge education and work, empowering each learner to explore, decide and prepare for dynamic and evolving careers.

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Instruction Sheet

Thank you again for your validation review of Version 3.2 of the modernized National Career Clusters Framework. Please spend time thoroughly reviewing the Framework and all associated materials. Additional Frequently Asked Questions, video recordings, and explainers can be found on Advance CTE's website.

Please note that the Framework is currently arranged with Cross-Cutting Clusters at the top, and then alphabetically for the rest. There is no hierarchy of Clusters to the Framework.

Important Definitions:

- **Cluster** - Industry sector as defined by groupings from SOC and NAICS.
- **Sub-Cluster** - Major grouping of career areas within a given sector that have similar skills as defined by industry area.
- **Cross-Cutting Cluster** - Clusters that are based on both sector and contextualized functions instead of purely discrete industry sectors; these clusters have both sub-clusters and implications for courses taken in other cluster areas.
- **Sample Programs of Study -** Please note that the programs of study mentioned here are purely illustrative and may vary from state to state. They represent actual programs of study in at least one state but are not universally applicable across all states.

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Career Cluster Model - Grid View

Advanced Manufacturing Engineering Health, Safety & Quality Assurance Industrial Machinery Production & Automation Robotics	**Agriculture** Agricultural Commerce Agricultural Technology & Automation Animal Science Food Science & Processing Plant Systems Water Systems	**Arts, Entertainment & Design** Design & Digital Arts Fashion & Interiors Film & Broadcasting Fine Arts Lighting & Sound Engineering Performing Arts	**Construction** Architecture & Civil Engineering Construction Planning & Development Operators & Maintenance Skilled Trades
****Digital Technology** Data Science & AI IT Support & Services Network Systems & Cybersecurity Software Solutions Unmanned Vehicle Technology Web & Cloud	**Education** Early Childhood Development Education Administration Learner Support & Community Engagement Teaching, Training & Facilitation	**Energy & Natural Resources** Clean & Alternative Energy Conservation & Parks Ecological Research & Development Environmental Protection Resource Extraction Utilities	**Financial Services** Banking & Credit Financial Strategy & Investments Insurance Real Estate
Health & Human Services Behavioral Health Biotechnology Research & Development Community & Social Services Health Data & Administration Personal Care Services Physical & Holistic Health	**Hospitality & Events** Accommodations Conferences & Events Culinary & Food Services Travel & Leisure	****Management & Entrepreneurship** Accounting Business Information Management Business Management & Operations Entrepreneurship & Small Business Project Management Regulation	****Marketing & Sales** Marketing & Advertising Market Research, Analytics & Ethics Retail & Customer Experience Strategic Sales
Public Service & Safety Emergency Response Judicial Systems Local, State & Federal Services Military & National Security Public Safety	**Supply Chain & Transportation** Air & Space Transportation Ground & Rail Transportation Maintenance & Repair Marine Transportation Planning & Logistics Purchasing & Warehousing	** = Cross-Cutting Clusters** Denote careers that overlap in all industries, highlighting the versatile and interconnected nature of today's workforce. They can stand on their own or be contextualized in each cluster and emphasize the need for adaptability in navigating the modern economy.	**Notes:** *Clusters are listed in alphabetical order.* *Clusters & Sub-Clusters represent the entire world of work (see definitions).* *Programs of Study are now in local state frameworks.*

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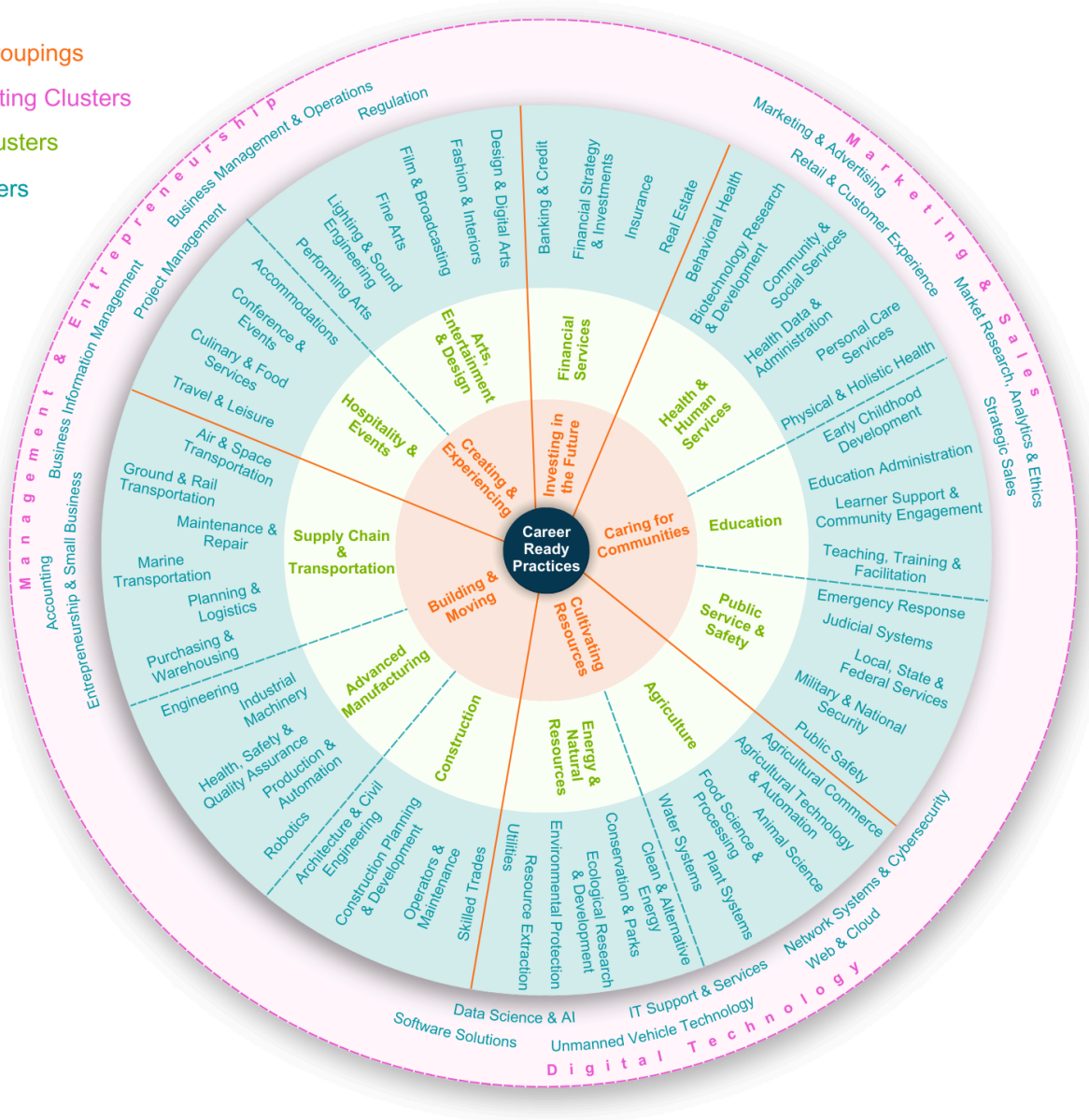
Career Cluster Model - Wheel View

Key:

- Cluster Groupings
- Cross-Cutting Clusters
- Career Clusters
- Sub-Clusters



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Career Cluster Blueprint Title: *Sub-Title*	
Cluster Definition: Definition	
Sub-Clusters	**Sample Programs of Study**
Sub-Cluster Title: Definition	Illustrative Programs of Study
Sub-Cluster Title: Definition	
Sub-Cluster Title: Definition	

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Cross-Cutting Cluster Digital Technology: *Modernizing Industries and Connecting Communities*

Cluster Definition: The Digital Technology Career Cluster combines the development of digital systems that support communication and data storage using critical technologies like artificial intelligence, data analytics, and cybersecurity. It prepares professionals to navigate and lead in the constantly evolving tech landscape, focusing on everything from software development to data analytics to cyber safety. This cluster drives innovation across all industries and clusters to tackle complex challenges and opportunities in our communities and economies.

Sub-Clusters	Sample Programs of Study
Data Science & Artificial Intelligence: Careers combining the power of data analysis, machine learning, and artificial intelligence, including key processes like data modeling and natural language processing. Professionals in this field apply critical thinking to work on innovative solutions to interpret vast amounts of information, automate decision-making processes, develop intelligent algorithms that improve with experience, and enhance communication between humans and machines. Artificial intelligence is poised to revolutionize all industries by enhancing efficiency, personalizing experiences, and driving innovation.	Applied Data Science & Analytics
Information Technology (IT) Support & Services: Careers focused on providing assistance and problem-solving solutions for software, hardware, and other technology-related issues to ensure smooth and efficient operation of communication and data systems for individuals and organizations.	Information Support & Services
Network Systems & Cybersecurity: Careers establishing and managing communication networks and protecting them against cyber threats. This includes network setup, administration, maintenance, and the implementation of security measures to prevent unauthorized access and data breaches.	Computer Networking Cybersecurity Information Technology Systems
Software Solutions: Careers involved in the development and maintenance of software solutions, built on computer science and encompassing programming, application development, and both front-end and back-end software development. It also includes developing technologies such as augmented reality/virtual reality (AR/VR), the Internet of Things, distributed ledger technologies, and quantum computing which cross into data science and artificial intelligence (AI) technology. It involves creating the underlying code and systems that power applications, designing user interfaces for optimal user experience, and building the server-side technologies that process data behind the scenes.	App Design Computer Simulation Game Development Programming
Unmanned Vehicle Technology: Careers related to the development, operation, and use of unmanned vehicles, such as unmanned aerial vehicles (UAVs), drones, and autonomous ground vehicles, across various sectors. This field is grounded in the study of robotics/remote control and the use of software for data science applications. Applications include aerial surveying, precision farming, search and rescue, delivery services, and infrastructure inspection. Professionals in this field engage in design, programming, data analysis, and operational management.	Drone Technology Unmanned Aircraft Systems
Web & Cloud: Careers focused on creating and managing websites and web applications, including front-end and back-end development and maintenance, as well as overseeing cloud services and infrastructure. It merges software skills with user interface/user experience (UI/UX) and cloud management expertise, ensuring website functionality, security, and cloud efficiency.	Web & Digital Communications Web Development Cloud Computing

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Cross-Cutting Cluster Management & Entrepreneurship: *Driving Business Success Across All Industries*

Cluster Definition: The Management & Entrepreneurship Career Cluster involves skills and occupations that are essential across all industries, focusing on optimizing operations, strategic planning, and workforce management. It merges key areas such as accounting, data management and analysis, human resources, general operations, project management, and leadership. This cluster ensures businesses of all sizes and types efficiently meet their goals, adapt to market changes, and maintain competitive advantage.

Sub-Clusters	Sample Programs of Study
Accounting: Careers in managing financial records for individuals and businesses and advising on individual and family financial planning and debt management. This includes accountants who ensure financial accuracy and compliance, and personal finance advisors who guide individuals in savings, investments, and retirement planning. Financial auditors play a crucial role in this sector, ensuring the integrity and reliability of financial information through comprehensive audits and assessments.	Accounting Business Finance Economics
Business Information Management: Careers involving managing and analyzing data to aid business decision-making, featuring roles like data analysts and information systems managers, focused on improving operations through technology.	Business Technology Applications
Business Management & Operations: Careers encompassing leadership and the oversight of workforce teams, business activities, strategic planning, operations personnel, general managers, and management consultants fostering a positive work environment while optimizing processes and leading growth initiatives.This field also involves human resource management, recruitment, and professional development.	Business Essentials Business Management Human Resources Management
Entrepreneurship & Small Business: Careers grounded in leadership and focused on initiating and managing businesses, including startups, small businesses, gig economy participation, and social enterprises. It includes identifying opportunities, strategy, and financing emphasizing innovation, risk management, and ethical practices. Entrepreneurship and small businesses significantly impact all sectors in the US by driving employment and fostering innovation.	Entrepreneurship
Project Management: Careers focused on planning, leading, initiating, executing, controlling, and closing out projects to achieve specific goals within a set timeline and budget. This role is essential in all industries as it ensures that projects are completed efficiently and effectively, aligning resources and efforts with strategic business objectives.	Principles of Management
Regulation: Careers dedicated to corporate fiduciary responsibility ensuring all industries adhere to health, safety, financial, and environmental regulations. Professionals within this field develop and enforce policies, conduct inspections and audits, and implement measures to protect worker safety, public health, and the environment. They play a crucial role in maintaining compliance and accountability across various sectors.	Business Law

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Cross-Cutting Cluster Marketing & Sales: *Improving Communication and Connections*

Cluster Definition: The Marketing & Sales Career Cluster focuses on promoting products, understanding consumer needs, engaging with communities, and driving sales. It integrates digital marketing, data analysis, brand promotion, customer relationship management, human-centered design, and retail strategies to build strong customer connections and support business growth. This cluster is essential for creating value, ensuring public transparency, and achieving commercial success in a competitive marketplace.

Sub-Clusters	Sample Programs of Study
Marketing & Advertising: Careers focused on utilizing digital technologies and traditional strategies to promote products and services to engage customers and maintain brand identity. This includes leveraging online platforms, social media, and email marketing to reach audiences digitally. Professionals in this field design and manage brand advertising campaigns and promotions to enhance brand image and market position.	Marketing Marketing Management
Market Research, Analytics & Ethics: Careers focused on gathering, analyzing, and interpreting market data and consumer behaviors to inform strategic decisions and enhance business relationships. Professionals in this field utilize data analysis to understand market trends, competition, and customer interactions, aiming to optimize customer retention and drive sales growth through informed strategies while promoting awareness of and ethical advertising practices, particularly those affecting the health and financial well-being of underserved populations.	Marketing Research Social Media & Analytics
Retail & Customer Experience: Careers focused on the essentials of retail operations and the delivery of outstanding customer experiences. It covers both physical and online store management, visual merchandising, inventory strategies, and customer service enhancement. Professionals in this field are prepared to drive retail success and customer satisfaction by creating engaging and personalized shopping experiences.	Merchandising
Strategic Sales: Careers helping businesses grow and achieve goals. This covers setting targets, refining sales processes, leading teams, and prioritizing excellent customer service in direct sales. The field encompasses professionals who specialize in business development, partnership building, and customer engagement, adapting to the dynamic demands of today's marketplace.	Business Communications

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Advanced Manufacturing: *The Future of Engineering and Producing*

Cluster Definition: The Advanced Manufacturing Career Cluster blends innovative technologies and practices to enhance design and production. It covers areas such as engineering, research and development, automation, equipment maintenance, safety protocols, and quality control. Advanced Manufacturing aims to increase efficiency and reduce waste, ensure safety, and produce high-quality goods, driving the industry's growth and adapting to modern demands.

Sub-Clusters	Sample Programs of Study
Engineering: Careers that use engineering principles to improve manufacturing processes and systems, and design of products. Engineers tackle production challenges, boost efficiency, leverage advanced technologies, and contribute to the sector's advancement. The manufacturing sector employs numerous engineering types including mechanical, chemical, electrical, materials, and industrial. This sub-cluster also involves research and development and prototyping for emerging products and systems.	Engineering & Technology Pre-Engineering Semiconductor Manufacturing Engineering Technology
Health, Safety & Quality Assurance: Careers dedicated to ensuring workplace safety, environmental compliance, and product quality. Professionals develop and implement standards and practices to maintain safe and sustainable operations while conducting rigorous testing and inspections to uphold product integrity.	Health, Safety & Environmental Assurance
Industrial Machinery: Careers associated with manual and computer-numerical-controlled machine operators, process control, instrumentation, technologists, and machinists who craft with advanced equipment, as well as professionals installing, maintaining, and repairing machinery.	Industrial Machine Mechanics Precision Machining
Production & Automation: Careers centered on the hands-on management and execution of manufacturing processes by technologists. It involves automation, operating advanced machinery, overseeing production lines, quality control, and ensuring efficient workflow. This sub-cluster includes specialized sectors like processed food and beverage production and textile manufacturing, emphasizing efficiency and adherence to industry standards across diverse production types.	Apparel & Textile Production Manufacturing Production Process Development
Robotics: Careers involved in developing, implementing, and maintaining technologies that deploy robotics. It encompasses roles focused on programming robots, overseeing production lines enhanced by robotics, mechatronics, and smart manufacturing concepts, and ensuring these technologies operate efficiently and safely.	Industry 4.0 Programs Robotics Technology

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Agriculture: *Cultivating Sustainability and Nourishing Innovations*

Cluster Definition: The Agriculture Career Cluster concentrates on the scientific advancement, cultivation, processing, and distribution of agricultural products, employing advanced technologies and sustainable practices to optimize global food systems, as well as other plant and animal-based industries like regenerative agriculture, sustainable logging, and fisheries. This cluster significantly overlaps with the Energy and Natural Resources Cluster, highlighting a symbiotic relationship that emphasizes stewardship and resilient communities.

Sub-Clusters	Sample Programs of Study
Agricultural Commerce: Careers focused on the economic aspects of agriculture, spanning consulting, analytical, retail, commercial, and wholesale sectors. It encompasses farm management, rangeland management, agribusiness finance, marketing, international relations, and supply chain management, essential for agricultural profitability. Key roles include farm managers and ranchers of various scales and agricultural finance specialists, all crucial for profitable and sustainable agricultural enterprises.	Agribusiness Agricultural Policy Agricultural Finance
Agricultural Technology & Automation: Careers at the intersection of agriculture and technology, focusing on the operation, maintenance, automation, agricultural engineering, and design of agricultural equipment and systems. It includes innovative farming methods such as precision, urban, and vertical farming to increase efficiency, productivity, and sustainability in agriculture.	Agricultural Technology Precision Agriculture Urban Farming
Animal Science: Careers in this field involve both promoting the health and wellbeing of animals, including companion, farm, and zoo animals, and facilitating the efficient production of animal-related products within the food system. This involves the care, breeding, and management of livestock and poultry, aiming to optimize the production of meat, dairy, eggs, and other animal products. It includes studying animal health, genetics, nutrition, and pharmaceuticals to improve animal welfare and production efficiency.	Animal Nutrition Livestock Management Veterinary Science
Food Science & Processing: Careers centered on applying scientific and technological principles to the development, enhancement, processing, and usability of agricultural food products. Professionals in this field work with fruit, vegetable, grain, and meat processing, ensuring these products are safe, nutritious, and ready for consumption. Their work is crucial in maintaining quality control and nutritional value, enhancing product freshness, and meeting consumer and regulatory standards.	Food Science Meat Science Sustainable Food & Farming
Plant Systems: Careers involving the study and management of plant growth, soil health, and pest management, focusing on sustainable crop production for both food and goods. It includes careers in agronomy, horticulture, forestry, rangeland management, and soil science, aimed at enhancing crop yields, preserving soil resources, and developing advanced production practices.	Horticulture Forestry Plant Science
Water Systems: Careers centered on the effective management and use of water resources in agricultural settings, including precision irrigation, aquaculture, and fisheries. Professionals in this area are dedicated to maximizing water efficiency and productivity in farming operations to enhance crop yield and support sustainable fish farming practices.	Aquaculture Marine Biology

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Arts, Entertainment & Design: *Inspiring Creativity, Innovation, and Artistry*

Cluster Definition: The Arts, Entertainment & Design Career Cluster combines creative roles in visual and performing arts, film, journalism, fashion, interior design, and creative technologies. This cluster focuses on creating, producing, and sharing artistic and design work across multiple platforms, aiming to entertain, inform, beautify, and inspire.

Sub-Clusters	Sample Programs of Study
Design & Digital Arts: Careers encompassing the creation and production of visually engaging digital content such as animation, visual marketing, graphic design, print media, augmented reality/virtual reality (AR/VR), web design, game design, and user interface/user experience (UI/UX) professions. This combines artistic talent and technology to produce interactive content, entertainment, industrial, product and packaging design, and promotional materials.	Digital Animation Graphic Arts
Fashion & Interiors: Careers bridging the creative and commercial realms of fashion design, production, marketing, and sales with the art and science of interior design and decoration. It encompasses careers dedicated to creating, promoting, and selling apparel, accessories, costuming, and footwear, alongside those focused on enhancing interior spaces' functionality and aesthetic appeal.	Apparel & Textiles Fashion Design Interior Design
Film & Broadcasting: Careers encompassing film, television, radio, journalism, and digital broadcasting careers, focusing on content creation, production, and distribution. This includes direction, production, cinematography, and publishing, emphasizing storytelling and technical expertise. It also highlights the impact of emerging technologies and artificial intelligence (AI), such as enhancing visual effects and streamlining production. Broadcasting also includes technologies like streaming and podcasting, transforming audience engagement and content consumption.	Broadcasting Technology Filmmaking: Production & Managerial Arts Video Production
Fine Arts: Careers focused on the creation, promotion, and sale of visual art forms including painting, sculpture, and pottery. Professionals in this field focus on producing works that not only possess aesthetic value but also serve as mediums for expression. They are involved in every stage from conceptualization to exhibition, ensuring that art is accessible and resonates deeply with audiences.	Fine Arts Museum Studies
Lighting & Sound Engineering: Careers in this field specialize in sound engineering and lighting design, which are vital for creating immersive experiences in film, music, performing arts, fine arts, and interiors. Professionals in this field adeptly manipulate sound and light to set moods, highlight themes, and enhance audience engagement, contributing significantly to the success and impact of artistic and design endeavors.	Audio & Visual Technology
Performing Arts: Careers focused on the technical and management elements of the performing arts and entertainment industry to produce and stage live artistic and athletic performances, including theater, music, dance, opera, and sports. This sub-cluster also encompasses the core creative and artistic talents coming from actors, musicians, dancers and other performers intended to entertain, inform, and provoke thought in audiences. This sub-cluster covers a wide range of genres and styles, and plays a vital role in cultural preservation, expression and entertainment.	Performing Arts

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Construction: *Building Futures and Pioneering Sustainable Horizons*

Cluster Definition: The Construction Career Cluster focuses on professions involved in designing, planning, managing, and executing projects in the built environment. It emphasizes sustainable building practices to ensure structures are both environmentally responsible and resilient. Professionals in this field are pivotal in creating durable infrastructure that meets present needs without compromising future generations' ability to meet their own, covering a range of roles from architects and engineers to construction managers and skilled tradespeople.

Sub-Clusters	Sample Programs of Study
Architecture & Civil Engineering: Careers combining the architectural drafting, design and planning of buildings, structures, and landscapes with the application of scientific and technical expertise through civil and structural engineering to create functional systems. It focuses on developing sustainable, safe, and aesthetically pleasing spaces while ensuring structures are durable and compliant with regulations. This field spans residential, commercial, and public infrastructure projects, requiring a blend of creativity, technical precision, and problem-solving to meet modern societal and environmental challenges.	Architectural Design & Drafting Computer Aided Design (CAD) Landscape Architecture
Construction Planning & Development: Careers emphasizing the critical initial stages of construction and development projects, including pre-construction activities, property development, and land use planning. Tasks involve completing feasibility studies, site analysis, surveying, and cost estimation and securing required permits. Professionals ensure meticulous planning and preparation to optimize project success and integrate sustainable practices, reducing potential risks and delays.	Construction Management
Operators & Maintenance: Careers skilled in managing and servicing heavy equipment and machinery essential for building and infrastructure projects. They ensure these vital tools operate efficiently and safely, combining technical knowledge with mechanical skills. Their expertise is crucial for the smooth execution of construction tasks, maintenance of machinery reliability, and adherence to safety standards.	CDL A & B Diesel Mechanics
Skilled Trades: Careers focused on skilled work essential to construction and maintenance, including carpentry, welding, masonry, electrical, heating, ventilation, air-conditioning, and refrigeration (HVAC-R), and plumbing. These roles are critical in building, maintaining, and repairing infrastructure. Tradespeople play a key role in shaping our environment, combining hands-on skills with technical knowledge to ensure functionality and safety in both new and existing structures. Many skilled trades are also in high demand in the Advanced Manufacturing Cluster and the Utilities Sub-Cluster.	Carpentry Electrical Systems Green Construction HVAC-R Welding Technology

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Education: *Lifelong Learning for Transforming Lives and Enriching Futures*

Cluster Definition: The Education Career Cluster spans careers aimed at fostering learning from early childhood to adulthood, covering areas like teaching, instructional design, counseling services, community engagement, learner support, and educator training. This cluster emphasizes quality educational standards and lifelong learning, preparing individuals for success through all life stages by nurturing knowledge, skills, and critical thinking, encouraging personal growth in a constantly evolving world.

Sub-Clusters	Sample Programs of Study
Early Childhood Development: Careers dedicated to nurturing the holistic growth of children from birth to eight years old, including preschool teachers, childcare providers, and early intervention specialists. These professionals specialize in fostering physical, cognitive, emotional, and social development in early learners applying proven and promising strategies for whole-child wellness.	Early Childhood Education Developmental Education
Education Administration: Careers in managing and leading educational institutions, developing policies, curating and organizing knowledge and conducting research to improve education. It includes school and district administrators, policy analysts, librarians, and researchers focused on optimizing school functions, implementing policies, and exploring ways to enhance learning. Professionals work to ensure the effective operation of educational settings and promote continuous improvement through research and innovation.	Educational Leadership Library Science
Learner Support & Community Engagement: Careers focused on offering guidance and support to learners while building collaborative ties with families and communities. This includes academic advising, student health and wellness counseling, special education support, student life services in higher education, coaching, and career guidance within a school setting. It also includes community engagement practices that involve families, industry, and local resources for opportunities such as work-based learning, apprenticeships, and family support programs.	Professional Support Services
Teaching, Training & Facilitation: Careers encompassing teaching and instructional design roles across diverse educational levels, from kindergarten through grade 12 (K-12) to adult learning. This includes integrating educational technology and emerging teaching methods into curriculum development and delivery. Careers in this sub-cluster also provide professional development and training for educators while facilitating learning experiences for individuals and groups. Professionals promote lifelong learning in various settings, including schools, colleges, corporate environments, and community organizations.	Principles of Teaching

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Energy & Natural Resources: *Powering Progress and Preserving Our Planet*

Cluster Definition: The Energy & Natural Resources Career Cluster spans careers in traditional and renewable energy generation, utilities, environmental preservation and conservation, ecological research, and resource extraction. These industries focus on efficient and responsible resource management, aiming to minimize environmental impacts and meet global energy needs. An interconnected relationship exists with the Agriculture Cluster as practices in energy and resource management are directly influenced by agricultural production.

Sub-Clusters	Sample Programs of Study
Clean & Alternative Energy: Careers focused on energy generation from clean and alternative sources aimed at addressing climate change impacts. It encompasses the development and implementation of technologies to harness natural elements such as solar, nuclear, wind, and hydro power, alongside efforts in electrification and energy storage solutions. This is also inclusive of lithium battery recycling, carbon capture, and other energy and mineral reuse and reclamation.	EV Installation & Maintenance Solar System Design & Installation Wind Turbine Installation & Maintenance
Conservation & Parks: Careers rooted in environmental and natural sciences that involve managing and operating local, state, and national parks. They focus on protecting natural environments, including forests and waterways, managing wildlife and marine life, maintaining national lands, and promoting sustainability. This field merges ecological conservation with the development of recreational spaces, aiming to preserve nature while enhancing community well-being and environmental stewardship through accessibility to the public.	Environmental Science Natural Resources
Ecological Research & Development: Careers emphasizing the scientific study of and research in ecological, geothermal, electrical, chemical, nuclear, biological, environmental engineering, and other related sciences as it relates to energy production and the management of natural resources. It focuses on employing scientific methods to understand ecosystems, biodiversity, and the impacts of energy systems on the environment.	Ecology & Environmental Management Environmental Engineering & Technology Environmental Science & Sustainability
Environmental Protection: Careers centered on the regulatory environment and management of the environmental impacts of energy production and consumption. This sub-cluster involves developing and enforcing policies to protect air, water, land, forests, and other natural resources from pollution and degradation, conserving natural habitats and biodiversity, and applying scientific and engineering principles to solve environmental problems and improve climate resilience.	Climate Resilience Sustainable Communities
Resource Extraction: Careers focused on the extraction of natural materials like fossil fuels, minerals, and geothermal resources essential for energy and manufacturing. This includes careers in exploration, drilling, mining, fracking, mineral processing, quarrying, and petroleum engineering, emphasizing efficient resource extraction.	Mining Technology
Utilities: Careers involving infrastructure development and maintenance of transmission systems for electricity, gas, water, waste remediation, and telecom/broadband. These roles emphasize ensuring reliable connectivity to energy sources and other essential services. Opportunities exist in both public and commercial utilities, with a focus on operations and maintenance to guarantee uninterrupted access to vital resources.	Telecommunications Water & Wastewater Systems

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Financial Services: *Empowering Financial Resilience*

Cluster Definition: The Financial Services Career Cluster encompasses careers in managing and advising financial transactions, including banking, lending, corporate finance, debt management, accounting, insurance, and real estate. These careers contribute to economic stability and growth by supporting the financial health of individuals and organizations.

Sub-Clusters	Sample Programs of Study
Banking & Credit: Careers in this field involve money management, loans, microlending, and commercial and consumer credit across banks, credit unions, mortgage brokers, and finance companies. Professionals evaluate creditworthiness, manage loans, and provide financial solutions to facilitate access to capital for individuals and businesses, driving economic growth.	Banking Credit
Financial Strategy & Investments: Careers involved in managing a company's capital structure and corporate financial strategies, operations, and investments, including venture capital and private equity. This also includes careers focused on the acquisition of financial instruments like stocks, bonds, fixed-income products, emerging digital assets, and other resources aimed at income generation or asset appreciation. The sub-cluster encompasses tactics for small business fundraising and financing via microlending, operational scaling, and devising exit strategies to evolve a startup into a sustainable enterprise. Many careers in this sub-cluster ensure that financial practices and transactions adhere to legal and ethical standards.	Business Administration Securities & Investments
Insurance: Careers related to assessing risk, providing financial protection against losses, and offering products like life, health, and property insurance. Professionals in this field work to offer policies that safeguard individuals and businesses against potential losses.	Insurance Operations
Real Estate: Careers focused on the buying, selling, leasing, and management of properties, including residential, commercial, and industrial real estate. It also includes professions navigating the complex landscape of licensing, fair housing, zoning, environmental regulations, and financial laws to facilitate legal and ethical property transactions.	Real Estate

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Health & Human Services: *Supporting the Whole Health of Individuals, Families, and Communities*

Cluster Definition: The Health & Human Services Career Cluster promotes holistic well-being in individuals and communities through a diverse array of services. This includes technical, mental, therapeutic, and personal care, supported by medical and social sciences. By addressing social determinants of health and leveraging health data and science, this cluster aims to enhance the overall health and resilience of individuals, families, and communities.

Sub-Clusters	Sample Programs of Study
Behavioral Health: Careers dedicated to mental and emotional well-being, including counseling, psychology, and psychiatric services, aimed at supporting individuals through mental health challenges and promoting psychological health.	Counseling & Mental Health Services
Biotechnology Research & Development: Careers focused on research and development in the medical field, including biotechnology and scientific research. These professionals develop new treatments, drugs, and innovative medical technologies to advance healthcare.	Biomedical Science Biotechnology Research & Development
Community & Social Services: Careers that address the societal and environmental factors affecting health, such as public services, social work, and case management, aiming to improve health outcomes by tackling social inequalities and providing support services. This also includes clergy and spiritual support roles, which provide essential emotional and spiritual guidance to individuals and communities.	Human Services Social Work
Health Data & Administration: Careers centered on the management, analysis, and administration of health information and data. It encompasses fields such as health informatics, medical records, and healthcare administration, with professionals dedicated to enhancing healthcare delivery through effective technology and data management.	Health Informatics Medical Assisting Medical Record Keeping
Personal Care Services: Careers that offer beauty and wellness services such as hairdressing, nail care, skincare, and massage therapy, focusing on enhancing personal appearance and promoting relaxation and well-being. These professions are grounded in a thorough understanding of health and safety practices.	Barbering Cosmetology Massage Services
Physical & Holistic Health: Careers in allied health and healthcare that directly impact the physical well-being of individuals, including nursing, doctors, dentistry, therapeutic services, imaging and diagnostics, technicians, pharmaceuticals, and nutrition. Encompasses healthcare from pre-birth to death, addressing all stages from pediatrics to gerontology. Also includes careers that offer alternative and complementary health services such as homeopathy, acupuncture, and others that focus on the holistic well-being of individuals.	Allied Health Health Sciences Radiology Technician Pharmacy Technician Physical Therapy Principles of Acupuncture Sports Medicine

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Hospitality & Events: *Unlocking Adventures and Elevating Experiences*

Cluster Definition: The Hospitality & Events Career Cluster encompasses a broad range of services and experiences related to food and beverage, lodging, travel, events, and conferences. This cluster focuses on delivering quality customer service, memorable experiences, and seamless logistics to cater to the needs and preferences of guests, travelers, and event participants. This sector is characterized by its diversity, including everything from luxury hotels and international travel to local dining, cultural events, and business conferences, aiming to enhance the overall experience of visitors and attendees.

Sub-Clusters	Sample Programs of Study
Accommodations: Careers that support, operate, and manage businesses and services related to temporary accommodations, including hotels, motels, resorts, short-term rentals, and bed-and-breakfast establishments, focusing on providing guests with a comfortable and safe stay. Through advancing technology, hotel and resort management leverages sophisticated property management systems, online booking platforms, mobile-friendly services, and personalized guest experiences.	Hospitality Management Hotel & Resort Management
Culinary & Food Services: Careers dedicated to the service, operations, and management of establishments involved in the preparation and serving of food and drinks to customers with significant emphasis on providing exceptional culinary experiences and delivering high-quality customer service. These establishments vary widely, encompassing independently owned restaurants, nationwide restaurant chains, non-commercial dining facilities, bakeries, and catering services. Roles within this sub-cluster span all aspects and levels of food preparation, including beverage specializations, as well as restaurant management, operations support, and safety.	Culinary Pastry Arts Restaurant Management
Conferences & Events: Careers encompassing the planning, coordination, and execution of various events and conferences. It involves organizing conventions, trade shows, corporate, political, and personal events generating positive economic impact to communities. This field includes logistics, venue management, vendor coordination, budgeting, attendee management, marketing, and risk management. Professionals in this field require strong organizational, creative, and interpersonal skills to ensure the success of events and provide a positive experience for participants.	Event Management
Travel & Leisure: Careers focused on facilitating enjoyable travel, entertainment, and recreational activities. This includes travel facilitation through agencies and cruise ships, attractions like theme parks and museums, ethical management of gaming and betting operations, organization of sports events, maintenance of outdoor recreation venues and field management, and ecotourism, agri-tourism, and cultural-tourism.	Outdoor Recreation Tourism Management

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Public Service & Safety: *Shaping, Serving, and Protecting our Communities*

Cluster Definition: The Public Service & Safety Career Cluster encompasses roles in local, state, and federal government, legal and justice systems, security, and military operations, all aimed at promoting civic responsibility, and ensuring the well-being, security, and functionality of communities, states, and countries.

Sub-Clusters	Sample Programs of Study
Emergency Response: Careers focused on the immediate and strategic actions taken to address and manage crises and emergencies, including natural disasters, fire management and suppression, accidents, and other urgent situations. Professionals in this field are trained in rapid assessment, effective communication, and critical decision-making to mitigate risks, provide urgent medical services, and coordinate recovery efforts. They work in various settings, from government agencies to private organizations, playing a crucial role in safeguarding public health and safety.	Emergency & Fire Management Services Fire Science
Judicial Systems: Careers dedicated to maintaining an efficient legal system, upholding justice, fairness, and the rule of law for both individuals and companies. This encompasses a wide range of professions within the legal framework and court systems, focusing on ensuring that legal processes and justice delivery are carried out effectively.	Legal Studies Paralegal
Local, State & Federal Services: Careers in government agencies responsible for policy and economic development, ensuring democratic processes and public access, governance, public administration, public policy, urban planning, and community development. These fields deliver services that support the protection of public goods and community resources such as city parks, libraries, and recreation centers, and promote the well-being and sustainable growth of communities.	Economics Public Management & Administration Regional & Urban Planning
Military & National Security: Careers in this field involve safeguarding countries through defense operations, strategic planning, and technological resilience. Professionals prevent threats and ensure citizens' safety while serving in the military, government, or private sector.	National Security
Public Safety: Careers in law enforcement, corrections, and both public and private security. These careers focus on safeguarding communities, managing correctional and rehabilitation facilities, and providing comprehensive protective services.	Criminal Justice Law Enforcement Services Security & Protective Services

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Supply Chain & Transportation: *Driving Efficiency and Streamlining Tomorrow's Transport*

Cluster Definition: The Supply Chain & Transportation Career Cluster encompasses the movement, coordination and management of goods from production to consumption, ensuring efficient movement across various modes of transportation including air, ground, and water, as well as maintenance of the respective transport modes. This cluster integrates logistics and distribution networks to facilitate the seamless flow of materials and products, playing a crucial role in global commerce, economic development, and community health.

Sub-Clusters	Sample Programs of Study
Air & Space Transportation: Careers related to the operation, management, and support of both air and space transportation include air cargo and passenger services, as well as space exploration and satellite operations. This field incorporates the maintenance of electrical equipment such as radios, navigation equipment, autopilot systems, cables, entertainment systems, and more. It encompasses a wide array of roles, from pilots and air traffic controllers who ensure the safety and efficiency of air transport, to aerospace engineers, mission specialists, and astronauts who advance the boundaries of space travel and research.	Aviation Technology Avionics "Your Place in Space" Department of Education Program
Ground & Rail Transportation: Careers related to the transportation of goods and passengers by road and rail. This includes automotive, trucking, rail operations, and logistics services, focusing on efficient and safe ground transport. Within rail operations, professionals work in a variety of settings from urban transit systems, such as subways and light rail, to cross-country freight and high-speed passenger trains, emphasizing the diversity and specialization within rail transportation to meet a wide range of transportation needs.	CDL A & B Railroad Operations
Maintenance & Repair: Careers encompassing the repair and maintenance of various transportation modalities, including ground vehicles, rail systems, aircraft, and nautical vessels. The sector also integrates specialized areas such as auto body repair and it is increasingly influenced by advancements in technology, including the maintenance of electric vehicles (EVs) and systems for autonomous driving. Professionals in this industry ensure that all forms of transportation equipment operate safely and efficiently, adapting to new technologies to meet evolving demands.	Auto Body Technology Automotive Maintenance Diesel Mechanics Electric Vehicle Maintenance
Marine Transportation: Careers in the operation and management of maritime vessels and infrastructure for the transportation of goods and passengers, as well as the management of watercraft used in sports and leisure activities. This cluster includes roles such as ship captains, marine engineers, port operations managers, and professionals specializing in the oversight of recreational vessels like yachts, human-powered craft, and water powersport vehicles.	Marine Transport Vessel Operations
Planning & Logistics: Careers focused on managing and optimizing the supply chain's flow of goods and information. It encompasses roles in transportation planning, supply chain coordination, and efficient material sourcing, all aimed at enhancing efficiency, minimizing waste, and ensuring timely delivery. This field integrates modern technologies to improve production, drive innovation, and maintain competitiveness in global trade systems. This sub-cluster also includes urban and regional planning for transit.	Transportation, Distribution & Logistics Systems
Purchasing & Warehousing: Careers centered around procurement, warehousing, and facility upkeep. Professionals in procurement negotiate contracts, ensure cost-effective purchases, and manage supplier relationships. In warehousing, they oversee efficient storage, dispatch, and inventory control of goods. Facility maintenance professionals maintain supply chain facilities, ensuring operational efficiency and compliance with safety regulations.	Business Administration Supply Chain Management

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Appendix I - Crosswalk from Old Framework to Modernized Framework: Clusters Only

Yellow = Combined or Removed

Green = Cross-Cutting

Purple = New

Grey = Renamed/Re-organized

Current Cluster	New Cluster
Agriculture, Food & Natural Resources	Agriculture
Architecture & Construction	Construction
Arts, A/V Technology & Communications	Arts, Entertainment & Design
Business Management & Administration	Management & Entrepreneurship
Education and Training	Education
Finance	Financial Services
Government and Public Administration	COMBINED into Public Service & Safety
Health Science	COMBINED into Health & Human Services
Hospitality and Tourism	Hospitality & Events
Human Services	COMBINED INTO Health & Human Services
Information Technology	Digital Technology
Law, Public Safety, Corrections & Security	COMBINED into Public Service & Safety
Manufacturing	Advanced Manufacturing
Marketing	Marketing & Sales
STEM	Removed - Engineering was primarily placed in Adv. Manufacturing
Transportation, Distribution and Logistics	Supply Chain & Transportation
None	Energy & Natural Resources

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Appendix II - Crosswalk from Old Framework to Modernized Framework: Clusters and Pathways

Existing named pathways

Current Cluster	**New Cluster**
Agriculture, Food & Natural Resources	Agriculture
Current Pathways	**New Sub-Clusters**
Agribusiness Systems Animal Systems Environmental Service Systems Food Products & Processing Systems Natural Resources Systems Plant Systems Power, Structural & Technical Systems	Agricultural Commerce Agricultural Technology & Automation Animal Science Food Science & Processing Plant Systems Water Systems

Current Cluster	**New Cluster**
Architecture & Construction	Construction
Current Pathways	**New Sub-Clusters**
Construction Design/Pre-Construction Maintenance/Operations	Architecture & Civil Engineering Construction Planning & Development Operators & Maintenance Skilled Trades

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Current Cluster	New Cluster
Arts, A/V Technology & Communications	Arts, Entertainment & Design
Current Pathways	**New Sub-Clusters**
A/V Technology & Film Journalism & Broadcasting Performing Arts Printing Technology Telecommunications Visual Arts	Design & Digital Arts Fashion & Interiors Film & Broadcasting Fine Arts Lighting & Sound Engineering Performing Arts

Current Cluster	New Cluster
Business Management & Administration	Management & Entrepreneurship
Current Pathways	**New Sub-Clusters**
Administrative Support Business Information Management General Management Human Resources Management Operations Management	Accounting Business Information Management Business Management & Operations Entrepreneurship & Small Business Project Management Regulation

Current Cluster	New Cluster
Education & Training	Education
Current Pathways	**New Sub-Clusters**
Administration & Administrative Support Professional Support Services Teaching/Training	Early Childhood Development Education Administration Learner Support & Community Engagement Teaching, Training & Facilitation

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Current Cluster	New Cluster
Finance	Financial Services
Current Pathways	**New Sub-Clusters**
Accounting Banking Services Business Finance Insurance Securities & Investments	Banking & Credit Financial Strategy & Investments Insurance Real Estate

Current Cluster	New Cluster
Government & Public Administration	COMBINED into Public Service & Safety
Current Pathways	**New Sub-Clusters**
Foreign Service Governance National Security Planning Public Management & Administration Regulation Revenue & Taxation	

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Current Cluster	**New Cluster**
Health Science	Health & Human Services
Current Pathways	**New Sub-Clusters**
Biotechnology Research & Development Diagnostic Services Health Informatics Support Services Therapeutic Services	Behavioral Health Biotechnology Research & Development Community & Social Services Health Data & Administration Personal Care Services Physical & Holistic Health

Current Cluster	**New Cluster**
Hospitality and Tourism	Hospitality & Events
Current Pathways	**New Sub-Clusters**
Lodging Recreation, Amusements & Attractions Restaurants & Food/Beverage Services Travel & Tourism	Accommodations Conferences & Events Culinary & Food Services Travel & Leisure

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Current Cluster	**New Cluster**
Human Services	COMBINED INTO Health
Current Pathways	**New Sub-Clusters**
Consumer Services Counseling & Mental Health Services Early Childhood Development & Services Family & Community Services Personal Care Services	

Current Cluster	**New Cluster**
Information Technology	Digital Technology
Current Pathways	**New Sub-Clusters**
Information Support & Services Network Systems Programming & Software Development Web & Digital Communications	Data Science & Artificial Intelligence Information Technology Support & Services Network Systems & Cybersecurity Software Solutions Unmanned Vehicle Technology Web & Cloud

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Current Cluster	New Cluster
Law, Public Safety, Corrections & Security	Civics, Public Service & Safety
Current Pathways	**New Sub-Clusters**
Correction Services Emergency & Fire Management Services Law Enforcement Services Legal Services Security & Protective Services	Emergency Response Judicial Systems Local, State & Federal Services Military & National Security Public Safety

Current Cluster	New Cluster
Manufacturing	Advanced Manufacturing
Current Pathways	**New Sub-Clusters**
Health, Safety & Environmental Assurance Logistics & Inventory Control Maintenance, Installation & Repair Manufacturing Production Process Dev. Production Quality Assurance	Engineering Health, Safety & Quality Assurance Industrial Machinery Production & Automation Robotics

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Current Cluster	New Cluster
Marketing	Marketing & Sales
Current Pathways	**New Sub-Clusters**
Marketing Communications Marketing Management Marketing Research Merchandising Professional Sales	Marketing & Advertising Market Research, Analytics & Ethics Strategic Sales Retail & Customer Experience

Current Cluster	New Cluster
STEM	Removed Engineering was put into Advanced Manufacturing with a reference to Civil and Structural Engineering in Construction and Environmental Engineering in Energy
Current Pathways	**New Sub-Clusters**
Engineering & Technology Science & Mathematics	N/A

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Current Cluster	New Cluster
Transportation, Distribution and Logistics	Supply Chain & Transportation
Current Pathways	**New Sub-Clusters**
Facility & Mobile Equipment Maintenance Health, Safety & Environmental Management Logistics Planning & Management Services Sales & Service Transportation Operations Transportation Systems/Infrastructure Planning, Management & Regulation Warehousing & Distribution Center Operations	Air & Space Transportation Ground & Rail Transportation Maintenance & Repair Marine Transportation Planning & Logistics Purchasing & Warehousing

NEW

Current Cluster	New Cluster
None	Energy & Natural Resources
Current Pathways	**New Sub-Clusters**
	Clean & Alternative Energy Conservation & Parks Ecological Research & Development Environmental Protection Resource Extraction Utilities

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